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zone) (species-richness & species-interactions rel.) 594-604; Percina williamsi n. sp. (descrip, of habitat & environ. conditions) 605-613; Cottus (tallapoosae n. sp., chattahoochee n. sp.) (rocky shoals & riffles of sm. upland streams) 641-655; Schizodon scotorhabdotus n. sp. (prob. lentic) 711-725; Atractus ronnie n. sp. (on forest litter) 788-797; Halichoeres burekae n. sp. (reef crest) 798-807; Potamarius usumacintae n. sp. (freshw., in med.-lg. rivers) 818-828; Allobates niputidea n. sp. (wet trop. forests; adults in leaf litter) 844-854; Leptodactylus (sp., fuscus), Eleutherodactylus cf. juipoca, Proceratophrys sp. (Brazilian savannah) (diet var. & intrapopn. dynamics) 855-865; Amolops caelumnoctis n. sp. (mtn. streams, 2400 m elev.) 913-919; Hypsiboas (semiguttatus, curupi n. sp.) (montane forest) 933-951; Eurycea junaluska (larvae & stream habitat; human disturb.) 952-958; amphibians (biodiver. & ecology; conserv.; habitat loss & human disturb.) 967-979.

HIBERNATION, Gopherus agassizii (environ. cues for onset, duration & termination) 378–386; Kinosternon sonoriense (estivate during periods of extreme drought) 403–412; Cyclorana australis (aestivation; cocoon form.) 901–912.

HISTOLOGY, Arapaima gigas (C&S specimens show gen. enlargement of 1st parapophysis appears to be a synapomorphy) 218–224; Halichoeres burekae n. sp. (reprod. state) 798–807; Hemiramphus spp. & Oxyporhamphus spp. (vesicular swimbladder) 808–817.

HOME RANGE, Varanus komodoensis (size & struc.) 462–470; Gopherus polyphemus (affect of human handling) 614–621.

IMMUNITY, Plethodon cinereus (antifungal bacteria on skin) 630–640.

LARVAE, Colostethus subfolionidificans n. sp. (tdpl. descrip.) 114-122; Dicamptodon tenebrosus (surv. & growth; spatial & temporal var.) 123-130; Rana sylvatica (intraguild pred. on & compet. interactions btwn. spp.) 131-139; Hypomesus (chishimaensis, nipponensis) (phyl. anal.; alternate life hist. types) 180-185; Gopherus polyphemus (geogr. var.) 355-363; Luperosaurus corfieldi n. sp. (observ. in lab.) 413-425; Bufonidae, Hylidae, Ranidae (tdpl. oral deformities; parasite) 449-458; Litoria verreauxii alpina (tdpl. survey; modeling) 765-770; Allobates niputidea n. sp. (descrip.) 844-854; Hypsiboas (semiguttatus, curupi n. sp.) (tdpl. descrip.) 933-951; Eurycea junaluska (larvae & habitat usage; human disturb.) 952-958; anurans (tdpls. & detection of oral pathogens) 1024-1028.

LATERAL LINE, Cottus (tallapoosae n. sp., chattahoochee n. sp., plus 6 spp.) (counts) 641–655.

LIFE HISTORY, Hypomesus (chishimaensis, nipponensis) (mtDNA & nucl. DNA; alternate life hist. types) 180-185; Rana grylio (life cycle & develop.) 436-448; Gopherus polyphemus (life cycle) 471-477; Gopherus polyphemus (reprobehav.) 490-495; Oncorhynchus (clarki, mykiss,

masou, kisutch, tshawytscha, nerka, keta, gorbuscha) (life hist, traits added to phyl, anal.) 520-533; Cottus (tallapoosae n. sp., chattahoochee n. sp.) (reprod. & food avail.) 641-655; Crotalus horridus (affects of sex, color morph., age, & capture/recapture on surv. rate) 656-671; Probreviceps m. macrodactylus (egg clutch; seasonality) 726-733; Cyclura cychlura inornata (life table; reprod. age) 740-744; Anolis carolinensis (sex of offspring deter. in egg) 829-837; Rana muscosa (age, growth & longevity; skeletochron.) 986-993; Sistrurus catenatus (subadult growth & activity; conservation) 994-1000; Nannophrys ceylonensis (ontogen. changes, gut morph. & diet) 1012-1018.

LOCOMOTION, Storeria dekayi (modes in neonate; aquatic vs. terres.) (velocities w/ respect to temp.) 577-585; Sicydium (stimpsoni, punctatum) (allometry; pelvic sucker & climbing perfor-

mance) 755-764.

METHODS, Stenocerus santander n. sp. (osteology, radiograph) 56-61; Chelonia mydas (vision capabilities; oil droplet topography) 169-179; Micropogonias undulatus (spectrographs) 193-204; Arapaima gigas (C&S, occipital region) 218-224; Psilorhynchus (sucatio, balitora) (gill arch morph.) 267-280; Eleutherodactylus (coqui) (stomach content anal.) 281-291; Xenosaurus grandis (projection matrices) 324-333; Gasterosteus aculeatus (geometric morphometrics; sex. dimorph.) 336-349; Kinosternon sonoriense (tagging & radiotelemetry) 403-412; Varanus komodoensis (measur. Home range by radiotelemetry, min. convex polygon, kernel method) 462-470; Ambystoma tigrinum nebulosum (accuracy of skeletochron.) 471-477; Caretta caretta (stomach content anal.) 478-489; Oncorhynchus (clarki, mykiss, masou, kisutch, tshawytscha, nerka, keta, gorbuscha) (Bayesian anal.) 520-533; Trachemys scripta (C & N isotope discrimination & turnover) 534-542; Dascyllus albisella (stomach content anal.) 566-576; Percina (williamsi n. sp., macrocephala) (mtDNA cyt.b, phyl. anal.) 605-613; Gopherus polyphemus (affect of human handling) 614-621; Plethodon cinereus (SEM of skin bacterial flora) 630-640; Litoria verreauxii alpina (tdpl. survey; site occupancy modeling) 765-770; Potamarius (usumacintae n. sp.) (osteology, radiograph) 818-828; Crotalus mitchellii stephensi (mtDNA & nucl. DNA) 920-932; Colocongridae, Thalassenchelys coheni, Derichthyidae (mtDNA; phyl. anal.) 959-966; Rana muscosa (osteology; age, growth & longevity) 986-993; Sistrurus catenatus (subadult growth & activity & radio transmitters) 994-

MICROSATELLITE DNA, Esox spp. (GH gene derivation; amplification of 4th intron) 205-211.

MIGRATION, Plethodontidae (use of cave twilight zone during dry periods) 594-604; pond-breeding amphibians (4 spp.) (juv. behav., orient. & distrib.) 685-698; Caretta caretta (hatchling survival & orient.; pred.) 745-754.

MITOCHONDRIAL DNA, Percidae, Serranidae (rel. anal., taxon. implications) 35-55; Muraena (augusti, helena, melanotis, robusta plus 5 sympatric spp.) 101-113; Hypomesus (chishimaensis, nitronensis) (cvt.bw/ nucl. DNA; not genetically distinct) 180-185; Oncorhynchus (clarki, mykiss, masou, kisutch, tshawytscha, nerka, keta, gorbuscha) (added life hist. & behav. traits) 520-533; Bolitoglossa bramei n. sp. (belong in B. subpalmata group) 556-565; Percina (williamsi n. sp., macrocephala) (cyt.b; diverged 2.3 mya) 605-613; Probreviceps m. macrodactylus (ident. of clutch) (compar. to 9 other spp.) 726-733; Cyclura (carinata bartschi, c. carinata) (compar.) 734-739; Halichoeres burekae n. sp. (cyt.b; compar. to other New World Halichoeres) 798-807; Crotalus mitchellii stephensi (phyl. anal.; systematics; species status) (nucl. DNA) (vicariant events) 920-932; Colocongridae, Thalassenchelys coheni, De-

richthyidae (phyl. anal.) 959-966.

MORPHOLOGY, Ceratioidei (families & genera rel. based on morph. charac. of metamorph. females) 1-34; Stenocerus santander n. sp. (diff. from other Stenocerus by comb. charac.) 56-61; Hypancistrus (contradens n. sp., debilittera n. sp., furunculus n. sp., lunaorum n. sp.) (morph. features) 62-79; Gerres mozambiquensis n. sp. (unique comb. charac.) (redescrip. of G. maldivensis) (notes on 7 nominal spp.) 85-92; Alsophis portoricensis anegadae (morphometric charac.) (male/female compar.) 93-100; Muraena (augusti, helena, melanotis, robusta) (morphometric differences) 101-113; Colostethus subfolionidificans n. sp. (descrip. of adult & tdpl.; diagn.) 114-122; Arapaima gigas (devel. occipitial region) 218-224; Platymantis diesmosi n. sp. (diagn., descrip.) 251-266; Psilorhynchus (sucatio, balitora) (anatomy of gill arches) 267-280; Akysis (variegatus, scorteus n. sp., galeatus n. sp.) (descrip., differ in head sculpture) 292-303; Synaphobranchus calvus n. sp. (diagn., descrip.) (absence of head scales; unique blue belly) 304-314; Gasterosteus aculeatus (wild & laboratory popns, compared for sex, dimorph, btwn. male & female) 336-349; Hasemania nambiquara n. sp. (disting. by unique color. pttn.) 350-354; Sternarchogiton (nattereri, preto n. sp., labiatus n. sp.) (diagn., descrip.) 387-402; Luperosaurus corfieldi n. sp. (diagn., descrip.) 413-425; Bufonidae, Hylidae, Ranidae (descript. of tdpl. oral deformities) 449-458; Bolitoglossa (gomezi n. sp., bramei n. sp.) (diagn., descrip.; osteology) 556-565; Pachycara (priedei n. sp., cousinsi n. sp.) (diagn., descrip.) (compar. to congeners) 586-593; Percina (williamsi n. sp.) (diagn., descrip.) (related to P. macrocephala) 605-613; Photoplagios (lateofenestra n. sp.) (diagn., descrip.) 622-629; Cottus (tallapoosae n. sp., chattahoochee n. sp.) (diagn., descrip.) 641-655; Rhynchodoras (castilloi n. sp.) (diagn., descrip.) (doradid & auchenipterid morph.) 672-684; Careproctus (comus n. sp., faunus n. sp.) (diagn., descrip.) 699-710; Schizodon (scotorhabdotus n. sp., kneri, isognathus) (diagn., descrip.) (compar.) 711INDEX 1119

725; Probreviceps m. macrodactylus (descrip. of clutch & embryos) 726-733; Sicydium (stimpsoni, punctatum) (allometry; pelvic sucker, locomotion & climbing) 755-764; Ophichthus (brevirostris n. sp.) (diagn., descrip.) 783-787; Atractus ronnie n. sp. (diagn., descrip.) (hemipenis morph.) 788-797; Halichoeres burekae n. sp. (diagn., descrip.) (compar. w/ congeners) 798-807; Hemiramphus spp. & Oxyporhamphus spp. (vesicular swimbladder; phyl. rel.) 808-817; Potamarius usumacintae n. sp. (diagn., descrip.; head osteol.; tooth patches) 818-828; Allobates niputidea n. sp. (diagn., descrip.) (larvae descrip.) 844-854; Eutropiichthys (britzi n. sp., salweenensis n. sp., murius, burmannicus, vacha) (diagn., descrip.) 866-885; Malacosteus (australis n. sp., niger) (diagn., descrip.) 886-900; Amolops caelumnoctis n. sp. (diagn., descrip., variation) 913-919; Crotalus mitchellii stephensi (morph. characters; phyl. anal.) (mtDNA, nucl. DNA) (systematics) 920-932; Hypsiboas (curupi n. sp.) (diagn., descrip.) (semiguttatus) (redescrip.) 933-951; Nannophrys ceylonensis (ontogen. changes, gut morph. & diet) 1012-1018.

NOMENCLATURE, Percomorpha/Acanthomorpha (taxon. changes) (Epinephelidae & Niphonidae resurrected) (Moronoidei n. subo.) 35-55; Stenocerus santander n.sp. (allopatry w/ erythrogaster) (santander misident, for erythrogaster) 56-61; Hypancistrus (contradens n. sp., debilittera n. sp., furunculus n. sp., lunaorum n. sp.) 62-79; Gerres (mozambiquensis n. sp.) (maldivensis redescrip.) (5 spp. complexes; 5 nominal spp. of uncertain status) 85-92; Muraena (augusti, helena, melanotis, robusta) (augusti valid; robusta in Gymnothorax clade) 101-113; Colostethus subfolionidificans a. sp. 114-122; Eleutherodactylus (cordovae n. sp., orestes group defined) (meridionalis n. sp., conspicillatus group) 140-149; Astyanax (bockmanni n. sp.) (paranahybae of uncert. taxon. position) 150-162; Chaenophryne quasiramifera n. sp. 163-168; Hypomesus nipponensis (demoted, not sp. or ssp. level) 180-185; Platymantis diesmosi n. sp.) 251-266; Akysis (scorteus n. sp., galeatus n. sp.; variegatus spp. group) (redescrip. of variegatus) 292-303; Crepidophryne (epiotica, chompipe n. sp., guanacaste n. sp.) (spp. comparisons) (epiotica redescrip.) (diagn., descrip.) 304-314; Synaphobranchus calvus n. sp. 315-323; Hasemania (nambiquara n. sp.) 350-354; Pteropsaron (springeri n. sp., evolans, formosensis, heemstrai, uncisum, natalensis, neocaledonicus), Osoparon (karlik, verecundum) (diagn., descrip.) (abbrev. key) 364-377; Sternarchogiton (rev. of genus) (nattereri, porcinum, preto n. sp., labiatus n. sp.) (diagn., descrip.) 387-402; Luperosaurus corfieldi n. sp. (status chg.) 413-425; Bolitoglossa (gomezi n. sp., bramei n. sp.) 556-565; Pachycara (priedei n. sp., cousinsi n. sp.) (diagn., descrip.; compar. to congeners) 586-593; Percina williamsi n. sp. 605-613; Photoplagios (laterofenestra n. sp.) 622-629; Cottus (tallapoosae n. sp., chattahoochee n. sp.) 641-655; Rhynchodoras (castilloi n. sp.) 672-684; Careproctus (comus n. sp., faunus n. sp.) 699-710; Schizodon (scotorhabdotus n. sp.) (isognathus, rev. descrip.; lectotype) 711-725; Ophichthus (brevirostris n. sp.) (holotype only; diagn., descrip.) 783-787; Atractus (ronnie n. sp.) (holotype only; diagn., descrip.) 788-797; Halichoeres (burekae n. sp.) (diagn., descrip.) 798-807; Potamarius (usumacintae n. sp.) (diagn., descrip.) 818-828; Allobates (niputidea n. sp.) (diagn., descrip.) 844-854; Eutropiichthys (rev. genus) (britzi n. sp., salweenensis n. sp., murius, burmannicus, vacha) (diagn., descrip.) (key to spp.) 866-885; Malacosteus (australis n. sp., niger) (diagn., descrip.) (key to spp.) 886-900; Amolops caelumnoctis n. sp. (diagn., descrip.) 913-919; Hypsiboas curupi n. sp. 933-951; Bufo proboscideus, Phryniscus proboscideus (secondary homonyms) 1029.

NONINDIGENOUS SPECIES, Eleutherodactylus coqui (pred. on Haw. endemics) 281–291.

NUCLEAR DNA, Serranidae, Percidae (placement) 35–55; Muraena (augusti, helena, melanotis, robusta) 101–113; Esox spp. (GH gene derivation) 205–211; Percina (williamsi n. sp., macrocephala) (mtDNA cyt.b & diverg, time estimates) 605– 613; Crotalus mitchellii stephensi (phyl. anal., systematics) (mtDNA) (vicariant events) 920– 932.

ORIENTATION, pond-breeding amphibians (4 spp.) (juv. migrat.) 685–698; Caretta caretta (hatchling migrat. & survival) 745–754.

OSTEOLOGY, Muraena (augusti, helena, melanotis, robusta) (vert. formula differences) 101-113; Arapaima gigas (devel. of occipito-vertebral region) 218-224; Psilorhynchus (sucatio, balitora) (compar. osteol. of gill arches) 267-280; Synaphobranchus calvus n. sp. 315-323; Pteropsaron, Hemerocoetes, Trichonotus, Limnichthys (jaws & suspensorium), Pteropsaron springeri n. sp. (D fin pterygiophores) 364-377; Sternarchogiton (nattereri, preto n. sp., labiatus n. sp.) 387-402; Ambystoma tigrinum nebulosum (skeletochron.) 471-477; Bolitoglossa (gomezi n. sp., bramei n. sp.) (descriptive; tooth counts) 556-565; Cottus (tallapoosae n. sp., chattahoochee n. sp. cf. carolinae) (preoperculae, suborbital series) 641-655; Rhynchodoras woodsi (neurocranium) 672-684; Careproctus (comus n. sp., faunus n. sp., bowersianus, Temnocora candida) (pectoral girdles) 699-710; Schizodon (scotorhabdotus n. sp., kneri, isognathus) (C&S) 711-725; Halichoeres burekae n. sp. (green skeleton) (cranial bone comparison w/ H. pictus) 798-807; Potamarius usumacintae n. sp. (skull) 818-828; Rana muscosa (age, growth & longev.) (skeletochron.) 986-

PALEONTOLOGY, Luperosaurus corfieldi n. sp. (prob. speciation during Pleistocene isolation) 413–425; Percina williamsi n. sp. (diverged from P. macrocephala 2.3 mya) 605–613; Cyclura carinata (Pleistocene gene flow) 734–739; Allobates niputidea n. sp. (prob. speciation in

Pliocene) 844–854; Crotalus mitchellii stephensi (Pliocene vicariance; speciation) 920–932.

PARASITES, Stenocercus santander n. sp. (mite pockets diagnostic) 56–61; Bufonidae, Hylidae, Ranidae (Batrachochytrium dendrobatidis cause of tdpl. oral deformities) 449–458.

PARASITISM, Ceratioidei (evol. of sex. parasitism)

1-34.

PATHOLOGY, Bufonidae, Hylidae, Ranidae (oral deformities in tdpls.) 449–458; Plethodon cinereus (antifungal bacteria in skin) 630–640; anurans (tdpls. & detection of oral pathogens) 1024– 1028.

PHYLOGENETIC ANALYSIS, Ceratioidei (morph. charac.; monophyly confirmed) (families & genera rel.) 1-34; Percidae, Serranidae (rel. anal.) 35-55; Muraena (augusti, helena, melanotis, robusta plus 5 sympatric spp.) (ecol. & molec. anal.) 101-113; Colostethus (subfolionidificans n. sp.) (disting. from 14 other C. spp.) 114-122; Eleutherodactylus (cordovae n. sp., orestes group redefined) (meridionalis n. sp., conspicillatus group) 140-149; Hypomesus (chishimaensis, nipponensis) (mtDNA & nucl. DNA; alternate life hist. types) 180-185; Esocidae (minisatellites, GH gene) 205-211; Psilorhynchus (sucatio, balitora) (morph. of gill-arches) (more closely related to non-cyprinid cypriniforms) 267-280; Oncorhynchus (clarki, mykiss, masou, kisutch, tshawytscha, nerka, keta, gorbuscha) (no consensus w/ morph., mtDNA only; added behavioral traits & life hist. to resolve ambiguities) 520-533; Pachycara (priedei n. sp., cousinsi n. sp.) (compar. to congeners) 586-593; Percina (williamsi n. sp., macrocephala) (mtDNA cyt.b) 605-613; Cyclura (carinata bartschi, c. carinata) (mtDNA; ssp. validity re-evaluated) 734-739; Halichoeres (burekae n. sp.) (mtDNA) 798-807; Hemiramphus spp. & Oxyporhamphus spp. (func. & morph. rel.) 808-817; Allobates (niputidea n. sp. & other Allobates) (summary) 844-854; Crotalus mitchellii stephensi (morph. characters) (systematics) (phyl. anal.; mtDNA & nucl. DNA) (vicariant events) 920-932; Colocongridae, Thalassenchelys coheni, Derichthyidae (mtDNA; phyl. anal. & systematics) 959-966.

PHYSIOLOGY, Gopherus agassizii (environ. cues & hibernation effects) 378–386; Trachemys scripta (uptake of nutrients & metabolic processes) 534–542; Gopherus polyphemus (effect of handling & corticosterone levels) 614–621; Hemiramphus spp. & Oxyporhamphus spp. (func.; vesicular swimbladder) 808–817; Anolis carolinensis (eggs & hormones; sex of offspring) 829–837; Malacosteus (australis n. sp., niger) (light organ & red light prod.) 886–900; Cyclorana australis (aestivation; ecol.) 901–912; Testudo hermanni (ecol.; reprod.; chem. commun.; sex. selection; sex. dimorph.) 980–985.

POPULATION, Xenosaurus (grandis) (model of pop. dynamics) 324–333; Bufonidae, Hylidae, Ranidae (diff. popns. show variability in pttn. & no. of tdpl. oral deformities) 449–458; Lampropeltis getula (poss. causes of decline) 507–519; pond-

breeding amphibians (4 spp.) (juv. distrib., migrat., & orient.) 685–698; Litoria verreauxii alpina (status; threatened) 765–770; Leptodactylus (sp., fuscus), Eleutherodactylus cf. juipoca, Proceratophrys sp. (intrapopn. diet var.) (ecol. & evol. implications) 855–865; Sistrurus catenatus (subadult growth & activity; conserv.) 994–1000.

PREDATION, Crotalus catalinensis (diet compet. poss. drive for loss of rattle) 80–84; Alsophis portoricensis anegadae (Coenobita clypeatus major pred.) 93–100; Rana sylvatica (feed on eggs of Pseudacris feriarum) 131–139; Eleutherodactylus coqui (endemic invert. prey reduction) 281–291; Natrix tessellata (sit-and-wait piscivore) 426–435; Caretta caretta (diet shift from crabs to finfish) 478–489; Lampropeltis getula (generalist; list of prey) 507–519; Caretta caretta (hatchling surv.; pred. rates) 745–754; Oophaga pumilio (coloration, aposematism & chem. defense) 1006–1011; Pristidactylus volcanensis (hissing, alarm signals) 1019–1023.

REPRODUCTION, Ceratioidei (discuss. of reprod. parasitism) 1–34; Muraena (augusti, helena, melanotis, robusta) (diff. in reprod. strategy) 101-113; Colostethus subfolionidificans n. sp. (lays eggs on lower surface of live leaves) (tdpl. descrip.) 114-122; Osteocephalus taurinus, Phyllomedus tarsius (reprod. behav., breeding pond habitat avail.) 186-192; Xiphophorus helleri (female brood patch visual stimulus to male) 212-217; Crepidophryne (epiotica, chompipe n. sp., guanacaste n. sp.) (repro. behav. inferred from habitat) 304-314; Xenosaurus grandis (age at 1st repro.) 324-333; Gophemus polymerus (clutch size & freq., geogr. var.) 355-363; Kinosternon sonoriense (behav. sex differences) 403-412; Luperosaurus corfieldi n. sp. 413-425; Rana grylio (reprod. stages; age at maturity) 436-448; Gopherus polyphemus (attempted matings) 490-495; Probreviceps m. macrodactylus (morph. of clutch & embryos; seasonality; mtDNA; develop.) (compar. to 9 other brevicipitid spp.) 726-733; Cyclura cychlura inornata (delayed maturity, low reprod. output) 740-744; Anolis carolinensis (eggs; sex deter. of offspring) 829-837; Allobates (niputidea n. sp.) (tdpl. descrip.) 844-854; Testudo hermanni (ecol.; chem. commun.; sex. selection; sex. dimorph.) 980-985.

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